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TRANSLATION

USSR Specification of Invention Pertaining to Invention Certificate (11) 432934

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(72) Inventors: D.N. Nikolaev, V.I. Titov, E.A., Savel'eva, V.G. Novitskii, V.I. Rybnikov, V.M. Trifonov

(71) Applicant: All-Union Scientific Research Institute of Textile and Light Industry

(54) METHOD OF WET TREATMENT OF FIBERS

At the present time, wet treatment of fibers in the cut state and in yarn form is predominantly carried out by spraying (droplet deposition), or by immersion, or by the action of streams of liquid applied from two sides of the treated fibers. However, this type of treatment makes it impossible to make processing more intensive, due to inhibition of penetration of the treatment liquid to the surface of fibers. In addition, in a number of cases, a non-uniform treatment of the fibers is observed, since preliminary separation of fibers is not performed, and twisting of the fibers, as well as compaction of layers take place.

In order to make the process [of impregnation] more effective, according to the proposed method, the liquid used in the treatment is applied in the form of flat jets that meet one another at an angle of 120–150° at a pressure of no less than 0.1 Kg/cm² per 20 mm thickness of the fiber layer.

The jets form upon intersection a "fluidized layer" of gas and liquid before and after the point of intersection of the jets, aided by screen devices, such as screen conveyors, where after the fiber is subjected to further treatment.

Figure 1 shows a schematic representation of fiber treatment in the cut state. Figure 2 shows a schematic representation of forces acting upon an element of the fiber layer.

The layer 1 of fibers is conveyed, for example by a screen conveyor 2 into the "fluidized layer" zone (direction of movement of the fiber layer is indicated by an arrow). In this zone, the action of molecular forces is reduced, i.e., the viscosity of the liquid is reduced, and consequently, the fibers are loosened, and the layer 1 is equalized with respect to height and width. The vortex flow of liquid and gas causes the height of the fiber layer to increase 2 to 3 times. At the same time, the process of mass transfer if the physical fiber processing technology is speeded up.

Thereafter, the loosened fibers are subjected to to the action of flat jets 3 and 3' of the treatment liquid, due to the kinetic energy of the jets and the high degree of turbulence

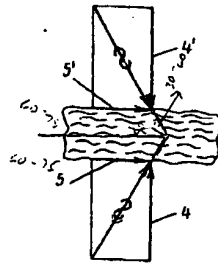
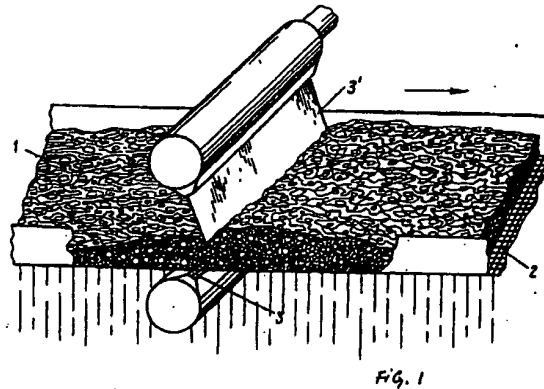
of the liquid streams. In the zone of intersection of the jets 3 and 3', the fibers are treated and straightened and oriented in parallel direction.

The lateral forces 4 and 4' (cf. Figure 2) lead to loosening of fibers and to increased permeation of the treatment liquid along the height of the fiber layer, whereas the longitudinal forces 5 and 5' tend to orient the fibers in a parallel direction.

INVENTION CLAIMS

1. Method of liquid treatment of fibers by jets of the treatment liquid that is conveyed from two sides of the fibers being transported, distinguished by the fact that, in order to make the process more efficient by way of formation of a fluidized layer, the latter is conveyed in the form of flat jets meeting one another at an obtuse angle.

2. Method according to Claim 1, distinguished by the fact that the jets of treatment liquid are conveyed in opposite directions at an angle of 120–150° and at a pressure of not less than 0.1 Kg/cm² for each 20 mm of thickness of fiber layer.



Translator's note: The translator may be contacted on the substance of this translation at ipascal@erols.com.

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